

(12) UK Patent Application (18) GB (11) 2 147 655 A

(43) Application published 15 May 1985

(21) Application No 8404373

(22) Date of filing 20 Feb 1984

(30) Priority data

(31) 3336802

(32) 10 Oct 1983

(33) DE

(71) Applicant

Ed Scharwachter GmbH & Co. KG, (FR Germany),
Hohenhagenerstrasse 26-28, 5630 Remscheid, Federal
Republic of Germany

(72) Inventor

Ernst Brockhaus.

(74) Agent and/or Address for Service

Brookes and Martin,
High Holborn House, 52-54 High Holborn,
London WC1V 6SE

(51) INT CL⁴

E05D 7/10 3/02 5/12

(52) Domestic classification

E2FEA PD

U1S 1820 1855 E2F

(56) Documents cited

GB 1599049

GB 0505417

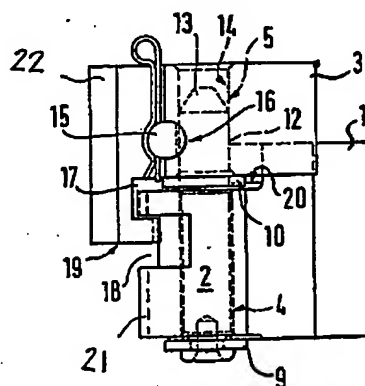
(58) Field of search

E2F

(64) Improvements in hinges

(57) A hinge for a vehicle door has hinge parts 1 and 3 and a hinge pin 2 secured against axial movement relative to the former part by a circlip 9 and washer 10. In the known hinges of this type, the hinge pin has splines which cooperate with grooves in the hinge eye 5 of the part 3. In the present hinge, the hinge pin and eye has smooth surfaces and are made to interlock by insertion of a locking pin 15.

FIG. 2



BEST AVAILABLE COPY

UD 2 147 000 A

FIG. 1

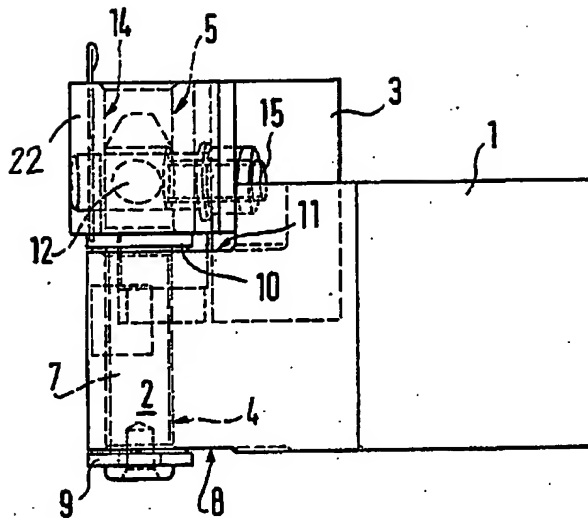


FIG. 2

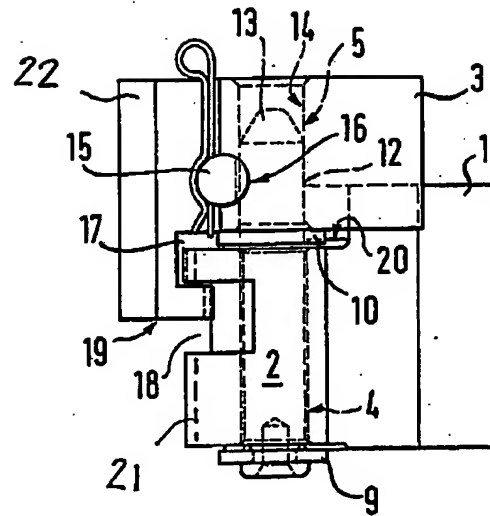
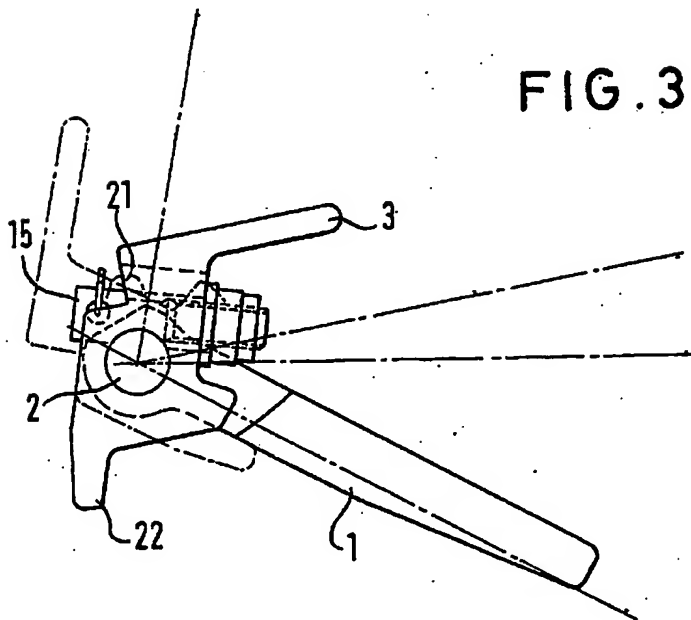


FIG. 3



SPECIFICATION

Improvements in hinges

5 It is usual for a vehicle door to be supported on demountable hinges which allow the door to be removed after it has been opened to an angle exceeding that to which it is normally opened in use. A typical hinge of this type has two hinge parts articulated together by a hinge pin which is rotatably journalled in a bushing of bearing material in the eye of one of the hinge parts but is secured against axial movement relative thereto. The other hinge part is made rotationally fast with the hinge pin, for example by means of inter-engaging splines and grooves. However, there is no interaction between the hinge pin and this other hinge part which prevents relative axial separation. Removal of the other hinge part from the pin is prevented within the normal operating range by inter-engaging projections, or projections and depressions. During assembly of the motor vehicle, the door is hung on its hinges which are adjusted in position as may be required. The door is then removed, the vehicle and door given its finish, and the door re-hung. A disadvantage of the known hinge is that the need to align the splines on the hinge pin with the grooves in the hinge eye makes it difficult to hang and re-hang the door, particularly because the hinge pins of both upper and lower hinges must be simultaneously inserted into the eyes of the demountable hinge parts. Another disadvantage of the known type of hinge is to be found in the arrangement for making the two hinge parts interlock in the axial sense within the normal operating range of the hinge.

Two separate proposals are made herein with a view to overcoming these problems. According to a first proposal there is provided a demountable hinge for vehicle doors comprising two hinge parts articulated together by a hinge pin which is rotationally fast with one of the hinge parts, the surface of that portion of the hinge pin which is received non-rotatably within its associated hinge part having a smooth, cylindrical, circumferential surface with the possible exceptions of a tapered or rounded tip and a recess extending transversely to the axis of the pin. In this way, the hinge pin may be introduced into the eye of the demountable hinge part very easily, while cost is saved by omitting the splines and grooves hitherto required. Conveniently, a separate component is employed to secure the hinge pin to the demountable hinge part. This separate component may consist of a key, possibly in the form of a pin which is passed through a bore which intersects with the hinge eye in the demountable hinge part. The hinge pin may have a recess into which the locking pin fits. Alternatively, the end face of the pin or the edge of the hinge eye may be deformed after re-hanging to secure the demountable hinge part to the hinge pin.

According to an alternative proposal which may be used in conjunction with, or independently of that discussed above, there is provided a demountable hinge for a vehicle door comprising two inter-

articulated hinge parts having respective hinge eyes through which passes a hinge pin which is rotationally fast with one of the hinge eyes and which is journalled in a bushing of bearing material in the other hinge eye, the hinge pin being secured against axial movement relative to the hinge eyes, the hinge parts having cooperable projections or projections and depressions which interengage to prevent relative axial separation of the hinge parts within a predetermined pivot angle corresponding to the normal opening angle of the hinge, the hinge parts consisting of portions of hinge profile having complementary cut-outs extending transversely to the axis of the head part of the hinge profile and disposed at equal distances from the upper edge of one hinge part and the lower edge of the other. This arrangement has the advantage that the means for causing the two hinge parts to interlock during relative rotation within the operating pivot angle can be made by cutting away portions from a basic profile. Preferably, each hinge part has been cut from a continuous length of metal, possibly formed by extrusion, so as to have a head portion along one edge of the length. The hinge eye may be formed during extrusion or by subsequent machining. By arranging the cut-outs at equal distances from respective edges of the hinge parts, a minimal amount of machining is required. A projection on one hinge part and extending radially to the hinge axis may serve as an end stop for limiting the opening angle, while a projection on the other which likewise extends radially to the axis will serve as part of the arrangement for interfittting the hinge parts. This latter projection on the head portion and the first-mentioned projection constituting the stop are formed by strips or beads along the length from which the hinge parts are cut. The projections are left in place or cut away, respectively, throughout equal lengths of the entire length of the hinge. Furthermore, the demountable hinge part is cut away in its head portion from the base of its radially oriented cut-out as far as the lower edge of the hinge part by a partial amount.

In the drawing:

Figure 1 is a side view of a demountable door hinge,

Figure 2 is an end view of the hinge shown in Figure 1, and

Figure 3 shows the hinge in plan, that is to say, looking in the direction parallel to the axis of the hinge pin.

Referring to the drawing, a demountable door hinge shown therein comprises first and second hinge parts 1 and 3 each having a substantially planar leaf portion and a profiled head portion articulated together by a hinge pin 2 which passes through respective hinge eyes 4 and 5 in the head portions of the two parts. Each hinge part is suitably adapted to enable it to be secured to a respective car door component, namely the door itself or the door frame. Fitted into the hinge eye 4 is a bushing of bearing material which receives a cylindrical portion 7 of the hinge pin. A circlip 9 snapped into a groove in the pin engages the un-

derside 8 of the head portion through which is a hinge eye 4 to prevent upward axial movement of the pin. Movement of the pin in the downward axial direction is prevented by a washer 10 engaged
 5 between a shoulder on the pin and the upperside of the head portion. The portion of the hinge pin received within the eye 5 has a smooth, cylindrical external surface 12 terminating in a rounded or tapered end 13 shaped to facilitate insertion of the
 10 pin into the hinge eye. The internal surface 14 of the hinge eye 5 is likewise smooth and cylindrical. The hinge pin is prevented from rotating within the hinge eye 5 and from moving axially relative thereto by means of a pin 15 which extends
 15 through a transverse aperture in the head portion and engaging with an arcuate cut-out 16 in the hinge pin. Although the hinge parts are prevented from disengaging while within their normal operating range, the hinge pin is preferably retained relative to hinge part 3. As illustrated, the pin is
 20 retained in place by a split pin. Any other suitable means may be provided for locking the hinge pin in place, or its end may be deformed for this purpose.

25 Each of the hinge parts is formed by cutting from a length of material having a suitable profile. To enable the two parts to interleave, the head portions are formed with radial cut-outs 17 and 18. The cut-out 17 in the upper hinge part 3 is located
 30 at the same distance from the lower edge 19 of that part as is the cut-out 18 in the other hinge part 1 from the upper edge 20 of part 1. As is shown particularly in Figure 3, the head portion of hinge part 1 has a projection 21 in the form of a beading,
 35 and that of the hinge part 3 has a projection in the form of a strip 22. The projection 22 extends over a portion of the length of the hinge eye 5 but is cut away so as to form an opening limit stop. Conversely, the projection 21 is cut away over a portion
 40 corresponding to the height of the portion of the projection 22 on the other hinge part, and constitutes a part of the arrangement for interlocking of the two hinge parts. Consequently, a corresponding increase is produced in the height of the cut-out 18. Furthermore, the hinge part 3 is cut
 45 back in its head part from the base of the cut-out 17 to below the lower edge of that hinge part by a partial amount.

50 CLAIMS

1. A demountable hinge for vehicle doors comprising two hinge parts articulated together by a hinge pin which is rotationally fast with one of the
 55 hinge parts, the surface of that portion of the hinge pin which is received non-rotatably within its associated hinge part having a smooth, cylindrical, circumferential surface with the possible exceptions of a tapered or rounded tip and a recess extending
 60 transversely to the axis of the pin.

2. A demountable hinge for a vehicle door comprising two interarticulated hinge parts having respective hinge eyes through which passes a hinge pin which is rotationally fast with one of the
 65 hinge eyes and which is journaled in a bushing of

bearing material in the other hinge eye, the hinge pin being secured against axial movement relative to the hinge eyes, the hinge parts having cooperating projections or projections and depressions
 70 which interengage to prevent relative axial separation of the hinge parts within a predetermined pivot angle corresponding to the normal opening angle of the hinge, the hinge parts consisting of portions of hinge profile having complementary cut-outs extending transversely to the axis of the head part of the hinge profile and disposed at equal distances from the upper edge of one hinge part and the lower edge of the other.

3. A hinge according to claim 2, wherein each hinge part has a projection extending radially of the hinge axis, one of which projections constitutes a stop for limiting the opening angle of the hinge, and the other of which constitutes part of the arrangement for interlocking the hinge parts.

85 4. A hinge according to claim 3, wherein the projections are integral with the hinge profile and are left in place and cut away respectively over equal heights.

5. A hinge according to any of claims 2 to 4,
 90 wherein the hinge profile of one hinge part is cut away from the base of its cut-out to the lower edge of the hinge by a partial amount.

6. A hinge substantially as hereinbefore described with reference to and as illustrated in the
 95 drawing.

Printed in the UK for HMSO, D8818933, 2/85, 7102.
 Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER: _____**

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.